

To students:

- Some programs for this discussion are on the CS1010 website, under the “Discussion” page.

I. Exploration

- Character constants do not only appear in the form of a single character such as 'A', '8' and '@'. Run the following program **q1.c**:

```
#include <stdio.h>

int main(void) {
    int ch1 = '\062', ch2 = '\x41';

    printf("ch1 = %c; ch2 = %c\n", ch1, ch2);

    return 0;
}
```

What is the output? Can you deduce the meaning of '\062' and '\x41'?

- Run the following program **q2.c** and deduce what **atoi()** function does. You need to include **<stdlib.h>** to use **atoi()**.

```
#include <stdio.h>
#include <stdlib.h>

int main(void) {
    char str[10];
    int value;

    printf("Enter input: ");
    fgets(str, 10, stdin);
    value = atoi(str);
    printf("Value is %d.\n", value);

    return 0;
}
```

What does **atoi()** convert? Try these inputs: (a) 123, (b) 123 456, (c) 123abc, (d) abc123.

3. (a) Assuming that a username can contain up to 8 characters, Brusco wrote this:

```
char username[8];  
.  
.  
.  
fgets(username, 8, stdin);
```

What is wrong with Brusco's code (**q3a.c**)?

- (b) What will happen if Brusco had written the following code (**q3b.c**)?

```
char fruitname[8];  
.  
.  
.  
strcpy(fruitname, "pineapple");  
printf("%s\n", fruitname);
```

4. Do you see any problem with the following program **q4.c**?

```
#include <stdio.h>  
  
int main(void) {  
    char board[2][3] = { {'a','b','c'}, {'d','e','f'} };  
    int i;  
  
    for (i=0; i<2; i++)  
        printf("%s\n", board[i]);  
  
    return 0;  
}
```

5. What is the problem with the following program **q5.c**?

```
#include <stdio.h>  
#include <string.h>  
  
int main(void) {  
    char *fruit1 = "apple", *fruit2 = "apple";  
    char *str1 = "yes", *str2 = "yes";  
  
    fruit1 = str1;  
    printf("%s\n", fruit1);  
  
    strcpy(fruit2, str2);  
    printf("%s\n", fruit2);  
  
    return 0;  
}
```

II. Programming on Strings

6. For each of the following string functions, write a small program to illustrate its use. Refer to Table 8.1 in the reference book or look up the Internet for the purpose of the functions.

- (a) **strcat()**
- (b) **strchr()**
- (c) **strtok()**

7. Write a function **count_nonspace(char str[])** to count the number of characters in **str** that are not white spaces. Do not use **strlen()** in your program.

[Optionally, write another version **count_nonspace(char *str)** that uses pointer manipulation, i.e. the function body uses ***str** instead of **str[i].**]

8. [CS1010 AY2010/1 Semester 1 Exam Q5]

Write a function **void convert_string(char str[], char dest[])** that converts **str** into **dest** by adding an asterisk between each letter in **str**. Any blank space in **str** is also replaced by an asterisk.

You may assume that there is one blank space between two words, and only letters and spaces appear in **str**. You may also assume that **dest** has sufficient space to hold the lengthened string.

For example, if **str** is

The quick brown fox

then **dest** will be

T*h*e*q*u*i*c*k*b*r*o*w*n*f*o*x

The above is an exam question. For this discussion, write a complete program that reads a string with at most 20 characters, and calls the **convert_string()** function. Do not use any string functions other than **fgets()** and **strlen()**.

9. A **palindrome** is a text that reads the same backward as forward. If we disregard case, then the following are palindromic words: “Madam”, “level”, “roTAtoR”.

(You may go to this website to find some interesting ones (there are many other sites): <http://www.innocentenglish.com/tongue-twisters-anagrams-palindromes/best-palindromes.html>. Here, however, we will focus on string without spaces in it.)

Write a program **palindrome.c** to request from the user a word with at most 20 characters. It then calls a function **isPalindrome()** which returns 1 if the word is a palindrome disregarding case, or 0 otherwise.

Your program should not create any additional array/string.

10. Modify the program **Unit16_Hangman_v1.c** to **Unit16_Hangman_v2.c** as follows:
- Program will keep a list of 10 words (or more if you like) and randomly choose a word from this list for the user to guess. Each word is at most 15 characters long.
 - Allow user the option to exit the game or continue another game.